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EXAMINER	
MEW, KEVIN D	
ART UNIT	**PAPER NUMBER**
2664	

DATE MAILED: 05/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/678,907	Applicant(s) ATARIUS ET AL.	
	Examiner Kevin Mew	Art Unit 2664	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 November 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10,11,15,25,26,30-58,62 and 66-80* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *10-11, 25-26, 31-40, 41-58, 62, 66-72* is/are allowed.

6)☒ Claim(s) *15,30 and 73-80* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11/28/2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Final Action

Response to Amendment

1. Applicant's Arguments/Remarks filed on 11/18/2004 regarding claims 15, 30, 31, 41, 73-76 have been considered and claims 10-11, 15, 25-26, 30-58, 62, 66-80 are currently pending. Claims 77-80 are newly added and claims 1-9, 12-14, 16-24, 27-29, 59-61, 63-65 have been canceled by the Applicant.

2. Acknowledgement is made of the amended abstract in response to the deficiencies cited in the objection to the specification of the previous Office Action. The corrections are acceptable and the objection to the specification has been withdrawn.

3. Acknowledgement is made of the amended drawings in response to the deficiencies cited in the objection to the drawings of the previous Office Action. The corrections and arguments regarding these deficiencies are acceptable and the objection to the drawings has been withdrawn.

4. Acknowledgement is made of the amended and canceled claims in response to the deficiencies cited in the claim objections of the previous Office Action. The corrections regarding these deficiencies are acceptable and the claim objections have been withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 15, 30, 73-80 are rejected under 35 U.S.C. 102(b) as being anticipated by the admitted prior art, Easton (USP 5,764,687).

Regarding claim 15, Easton discloses a transceiver to perform a method for processing code division multiple access signals received (**analog transmitter and receiver for demodulating a signal in a spread spectrum multiple access communication system**, see lines 1-4, col. 2, lines 41-43, col. 8 and lines 23-26, col. 7, and element 16, Fig. 2) through at least one multipath propagation channel (**the searcher searches out windows of offsets likely to contain multipath signal peaks suitable for assignment of the fingers**, see elements 14, 12a-c, Fig. 1) to produce at least one relative frequency error estimate (**frequency error**, see element 44, Fig. 3), comprising:

a processor (**analog transmitter and receiver**, see element 16, Fig. 1) for receiving and processing the signals using the local frequency reference oscillator to obtain representative complex numerical samples (**I and Q channel samples**) for processing (**analog transmitter and receiver containing a downconverter chain that outputs digitized I and Q channel samples at baseband and the sampling clock used to digitized the received waveform is derived from a voltage controlled local oscillator**, see lines 11-15, col. 5 and elements 16, 40, Fig. 2);

channel estimators for correlating (**dispreading**) the complex numerical samples (**I and Q chip samples are provided to QPSK despreaders**, see elements 104a and 104b, Fig. 3) with shifts of a locally generated despreading code (**I and Q PN sequences are generated from PN sequence generator**, see Fig. 3) and producing a number of complex channel estimates (**output of on-time despreader**, see line 53, col. 9 and signals going into Pilot Filers, Fig. 3), each corresponding to a different delayed ray of the at least one multipath propagation channel (**I and Q PN sequences are generated from PN sequence generator, which are delayed from their counterpart sequences in the base station by the multipath propagation delay from the base station to the mobile unit**, see lines 24-38, col. 9 and element 106, Fig. 3);

frequency error estimators (**cross product circuits**, see element 146, Fig. 3; note that one cross product circuit is used for each finger) for computing a frequency error estimate (**frequency error**, see element 44, Fig. 3) for each ray based on successive values of a respective one of the channel estimates (**each finger makes an estimate of the frequency error using the cross product operator**, see lines 39-47, and equation 3, col. 6 and Fig. 3); and

at least one summer (**frequency error combiner**, see element 26, Fig. 2) for performing a weighted summation of the frequency error estimates to provide at least one relative frequency error estimate (**frequency error estimate from each finger 44a-c are combined and integrated in the frequency error combiner to generate an integrator output to adjust the clock frequency in order to compensate for the frequency error of the local oscillator**, see lines 48-54, col. 6 and Fig. 2),

wherein the relative frequency error estimate is used to control the frequency of a local frequency reference oscillator (see lines 48-54, col. 6); and

the at least one summer produces at least one relative frequency error estimate separately for each base station (see lines 59-65, col. 4 and element 26, Fig. 2).

Regarding claim 30, the method for processing code division multiple access signals received through at least one multipath propagation channel to produce at least one relative frequency error estimate, comprising:

a processor (**analog transmitter and receiver**, see element 16, Fig. 1) for receiving and processing the signals using the local frequency reference oscillator to obtain representative complex numerical samples (**I and Q channel samples**) for processing (**analog transmitter and receiver containing a downconverter chain that outputs digitized I and Q channel samples at baseband and the sampling clock used to digitized the received waveform is derived from a voltage controlled local oscillator**, see lines 11-15, col. 5 and elements 16, 40, Fig. 2);

despreaders (**despreaders**, see element 104, Fig. 3) for different delayed rays of the multipath channel for correlating the numerical samples (**despreaders are provided with I and Q chip samples**) with different shifts of a locally generated wanted signal despreading code (**despreaders also receive I Q PN sequence generated by the PN sequence generator are delayed from their counterpart sequences in the base station by the multipath propagation delay from the base station to the mobile unit**, see lines 26-35, col. 9) over symbol intervals to produce streams of complex despread values corresponding to each ray and successive symbol interval (**output of depreaders produces a pilot pair for PI(n) and PQ(n) symbol n**, see lines 33-35, col. 9)

channel estimators for processing (**dispreading**) the frequency-corrected despread value streams (**I and Q chip samples are provided to QPSK despreaders with I and Q PN sequences are generated from PN sequence generator**, see elements 104a and 104b, Fig. 3) to produce complex channel estimates for each ray (**output of on-time despreader is pair of pilot I and pilot Q**, see line 53, col. 9 and signals going into Pilot Filers, Fig. 3);

frequency error estimators (**cross product circuits**, see element 146, Fig. 3; note that one cross product circuit is used for each finger) for determining a frequency error estimate (**frequency error**, see element 44, Fig. 3) for each ray based on successive values of a respective one of the channel estimates (**each finger makes an estimate of the frequency error using the cross product operator**, see lines 39-47, and equation 3, col. 6 and Fig. 3); and

at least one combiner (**frequency error combiner**, see element 26, Fig. 2) for combining the frequency error estimates to provide at least one relative frequency error estimate (**frequency error estimate from each finger 44a-c are combined and integrated in the frequency error combiner to generate an integrator output to adjust the clock frequency in order to compensate for the frequency error of the local oscillator**, see lines 48-54, col. 6 and Fig. 2),

wherein the frequency error estimates are computed separately for each base station (see lines 59-65, col. 4 and element 26, Fig. 2).

Regarding claims 73 & 75, Easton discloses an apparatus to perform the method for estimating a frequency error (**each finger makes an estimate of the frequency error**) between a local frequency reference of a receiver and carrier frequencies of one or more transmitters (**to**

adjust clock frequency of local oscillator in the analog transmitter and receiver, see lines 52-54, col. 6) comprising:

frequency error estimators for estimating frequency errors separately for each transmitter (**cross product circuits**, see element 146, Fig. 3; note that one cross product circuit is used for each finger); and

a combiner for combining the frequency error estimates to produce at least one relative frequency error estimate (**frequency error estimate from each finger 44a-c are combined and integrated in the frequency error combiner to generate an integrator output to adjust the clock frequency in order to compensate for the frequency error of the local oscillator**, see lines 48-54, col. 6 and Fig. 2).

Regarding claims 74 & 76, Easton discloses the apparatus of claim 73 to perform the method of claim 75, further comprising integrating the combined frequency error estimates (see lines 48-49, col. 6).

Regarding claim 77, Easton discloses the transceiver of claim 15, wherein at least one of the base station relative frequency error estimates is formed using two or more fingers of a RAKE receiver (a integrator frequency error estimate output is formed by combining frequency estimates from each finger 44a-c of a RAKE receiver, see col. 6, lines 28-65 and Fingers 12 of RAKE receiver, Fig, 2).

Regarding claim 78, Easton discloses the method of claim 30, wherein at least one of the base station frequency error estimates is formed using two or more fingers of a RAKE receiver (a integrator frequency error estimate output is formed by combining frequency estimates from each finger 44a-c of a RAKE receiver, see col. 6, lines 28-65 and Fingers 12 of RAKE receiver, Fig, 2).

Regarding claim 79, Easton discloses the apparatus of claim 73, wherein at least one of the transmitters frequency error estimates is formed using two or more fingers of a RAKE receiver (a integrator frequency error estimate output is formed by combining frequency estimates from each finger 44a-c of a RAKE receiver, see col. 6, lines 28-65 and Fingers 12 of RAKE receiver, Fig, 2).

Regarding claim 80, Easton discloses the transceiver of claim 75, wherein at least one of the transmitter frequency error estimates is formed using two or more fingers of a RAKE receiver (a integrator frequency error estimate output is formed by combining frequency estimates from each finger 44a-c of a RAKE receiver, see col. 6, lines 28-65 and Fingers 12 of RAKE receiver, Fig, 2).

Response to Arguments

6. Applicant's arguments filed on 11/18/2004 have been fully considered but they are not persuasive.

In response to applicant's argument that the Easton reference (USP 5,764,687) fails to show certain features of applicant's invention in claims 15, 30, 73, 75, it is noted that the feature upon which applicant relies (i.e., "estimating a frequency error separately for each transmitter whose signal is received") is indeed disclosed in Easton. Specifically, Easton discloses a mobile RAKE receiver that comprises fingers to receive a multipath signal of each pilot transmitted from each base station (col. 4, lines 56-67, and col. 5, lines 1-53) and that the frequency error estimates form each finger 44a-c are combined ad integrated in frequency error combiner to generate a frequency error estimate integrator output (see col. 4, lines 56-67, col. 5, lines 1-67 and col. 6, lines 1-54). In other words, the multipath signal of the pilot transmitted from each base station is received at the mobile RAKE receiver where the frequency error estimates from each finger of the RAKE receiver are combined and integrated to create an integrated output frequency error estimate. This integrated output frequency error estimate is the frequency error being estimated separately for the pilot of each base station. Therefore, it reads on the limitation "estimating a frequency error separately for each transmitter whose signal is received." Therefore, claims 15, 30, 73, 75 remain rejected under 35 U.S.C. 102(b) as being anticipated by Easton. By the same reasoning discussed above, the newly added claims 77-80 that depend from claims 15, 30, 73, 75, respectively, are also rejected under 35 U.S.C. 102(b) as being anticipated by Easton.

Allowable Subject Matter

7. Claims 10-11, 25-26, 31-40, 41-58, 62, 66-72 are allowed.

The following is a statement of reasons for the indication of allowable subject matter.

In claim 10, a transceiver comprising an error detection decoder for performing an error check on the decoded information bits, and to generate an error or no-error indication, wherein the relative frequency error estimate is only used to control the local reference oscillator when a no-error indication is generated.

In claim 25, a method for processing code division multiple access signals received through at least one multipath propagation channel to produce at least one relative frequency error estimate, comprising the steps of:

performing an error check on the decoded information bits and to generate an error or no-error indication, wherein the relative frequency error estimate is only used to control the local reference oscillator when a no-error indication is generated.

In claim 31, a transceiver for processing code division multiple access signals received through at least one multipath propagation channel to produce at least one relative frequency error estimate, comprising:

frequency error correctors for correcting frequency errors on each of the despread value streams by, for each of the despread value streams, progressively rotating the phase angle of successive despread values at a rate given by an associated frequency error integral.

In claim 41, a method for processing code division multiple access signals received through at least one multipath propagation channel to produce at least one relative frequency error estimate, comprising:

frequency error correctors for correcting frequency errors on each of the despread value streams by, for each of the despread value streams, progressively rotating the phase angle of successive despread values at a rate given by an associated frequency error integral.

In claim 62, a transceiver for processing code division multiple access signals received through at least one multipath propagation channel to produce at least one relative frequency error estimate, comprising:

wherein the combiner adds the real parts of the per ray frequency error estimates to obtain a real sum and adding the imaginary parts to produce an imaginary sum and computing the two-argument arctangent of the real and imaginary sum.

In claim 66, a method for processing code division multiple access signals received through at least one multipath propagation channel to produce at least one relative frequency error estimate, comprising the steps of:

wherein the combining step includes adding the real parts of the per-ray frequency error estimates to obtain a real sum and adding the imaginary parts to produce an imaginary sum and computing the two-argument arctangent of the real and imaginary sum.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Mew whose telephone number is 571-272-3141. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin can be reached on 571-272-3134. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WELLINGTON CHIN
UPERVISORY PATENT EXAMINER

KDM
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